

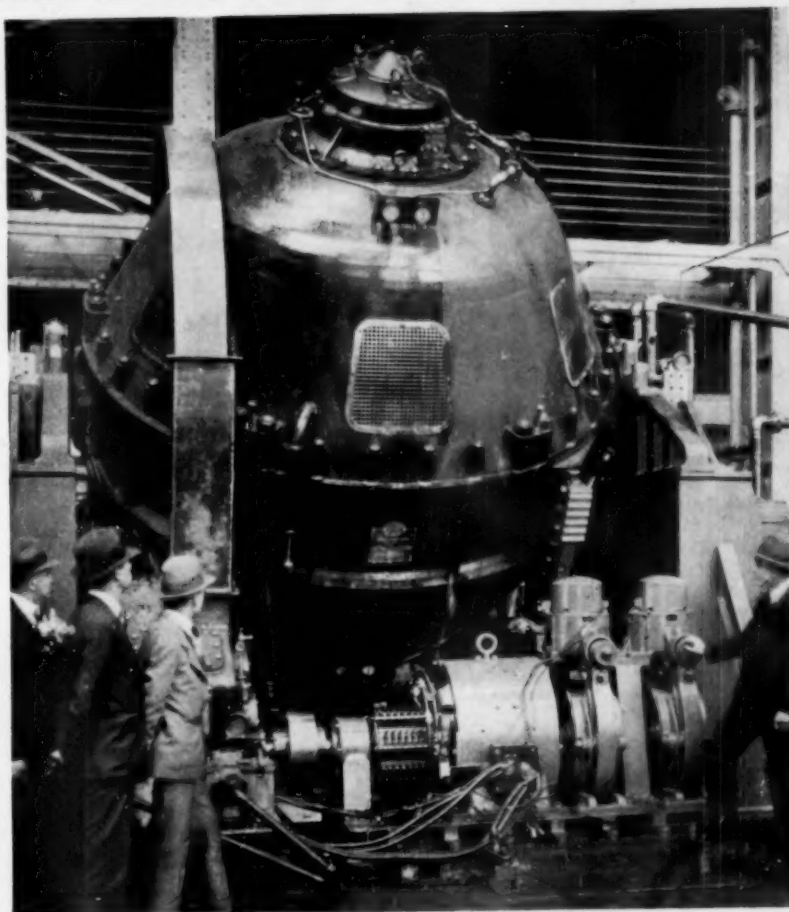
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APR 20 1931

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



APRIL 18, 1931

55-Ton "Top" to Make Ship Ride Smoothly

See Page 248

A

SCIENCE SERVICE PUBLICATION

## SCIENCE NEWS LETTER

VOL XIX

523

The Weekly  Current  
Summary of Science

Published by

## SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

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## DO YOU KNOW THAT

A Louisiana biologist says that muskrats keep any wound clean by constant licking, and if the flesh becomes infected they do not hesitate to gnaw it away.

Male parrots respond to teaching somewhat better than female birds.

Horace, Pliny, and other writers of ancient Rome complained of the noise of the city, long before automobile horns, street cars, and radios.

Pedestrians in Elizabeth, N. J., can now cross one busy intersection safely by means of a signal light which remains green for automobile traffic except when a pedestrian presses a button turning on a red light to stop vehicular traffic for a short interval.

In Massachusetts alone, four tons of bees work to fertilize the apple blossoms.

Experiments have shown that the afternoon rest of children is much quieter than their night rest.

There are plants in the Alps that blossom while covered with half a yard of snow.

Of the 700 species of trees in the United States and Canada, only about 10 per cent. are put to important economic uses at present.

One large baking company has found that weather influences cake sales; sweet cakes are much more in demand in cool spells of weather than in hot.

A new English language called Anglic has been introduced by a professor of the Royal University of Upsala, Sweden, who has found the most frequent spelling of the different sounds in English and uses that spelling to simplify the learning of English for foreigners.

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Science Service presents over the radio, an address

## UNTANGLING ONE OF NATURE'S PUZZLES

By Dr. B. Smith Hopkins, professor of inorganic chemistry at the University of Illinois, and discoverer of illinium, the most recent element whose isolation has been definitely established.

Friday, April 24, 3:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

## PHYSICS

# Bureau of Standards First In This Country to Liquefy Helium

**Winner of Friendly Race Finds That Intense Cold Increases Electrical Conductivity of Tin 100,000 Times**

**A**N EXTREMELY cold piece of tin conducts electricity a hundred thousand times better than tin at ordinary temperatures, it was confirmed by physicists of the National Bureau of Standards here when they liquefied helium gas for the first time in the United States.

Helium is the most difficult gas to turn into a liquid. A coil of tin through which electricity was passing was used by the scientists as one method of proving that they had achieved the United States' greatest cold, a temperature within three degrees Fahrenheit of the lowest temperature ever created by man. The greatest cold, called absolute zero, is 459 degrees below zero on the Fahrenheit scale. The lowest temperature reached in the Bureau of Standards experiment was minus 456 degrees Fahrenheit, while helium liquefied at minus 450 degrees.

Dr. H. C. Dickinson, Dr. F. G. Brickwedde, W. Cook, R. B. Scott and J. M. Smoot comprised the group that produced the extremely low temperature. Working in constant danger of their lives, and late at night long after the other scientists had left Uncle Sam's great research laboratory, they won a friendly race with Johns Hopkins University and the University of California for the honor of being the first institution in this country to liquefy helium.

Helium is the rare gas of the air, first discovered in the sun. It is obtained from natural gas in sufficient quantities to float the giant airships of the American Navy.

To turn it from a gas into a liquid, the scientists first make liquid hydrogen by compressing this highly inflammable gas to 2,200 pounds per square inch, cooling it with liquid air, then allowing it to expand in order further to cool itself. Then helium is compressed to 200 pounds per square inch and the liquid hydrogen is used to cool the helium. When the helium, already intensely cold, is allowed to expand it

gets so cold that it becomes liquid, the goal of the experiment.

Helium was first liquefied at Leiden, Holland, where the late Prof. Kamerlingh Onnes pioneered in low temperature research. The Berlin Imperial Institute and the University of Toronto have also made liquid helium.

*Science News Letter, April 18, 1931*

## ARCHAEOLOGY

## Stone Age Town Is Found In Delta of the Nile

**A** STONE AGE settlement, probably the oldest town in Egypt, has been discovered in the West Delta of the Nile by an expedition of the Vienna Academy of Sciences, under the leadership of Prof. Hermann Junker of the University of Vienna.

Near Merimde-Benisalâme the expedition has excavated the ruins of a great collection of huts, grain pits and other evidences of the primitive agricultural civilization of the New Stone

Age. The settlement straggled over an area of approximately eighty acres.

There is no order or organization about the place; houses, shops and working-places are all jumbled together helter-skelter. The construction material is the most primitive form of brick: simply irregular lumps of hardened clay formed by hand and plastered with Nile mud.

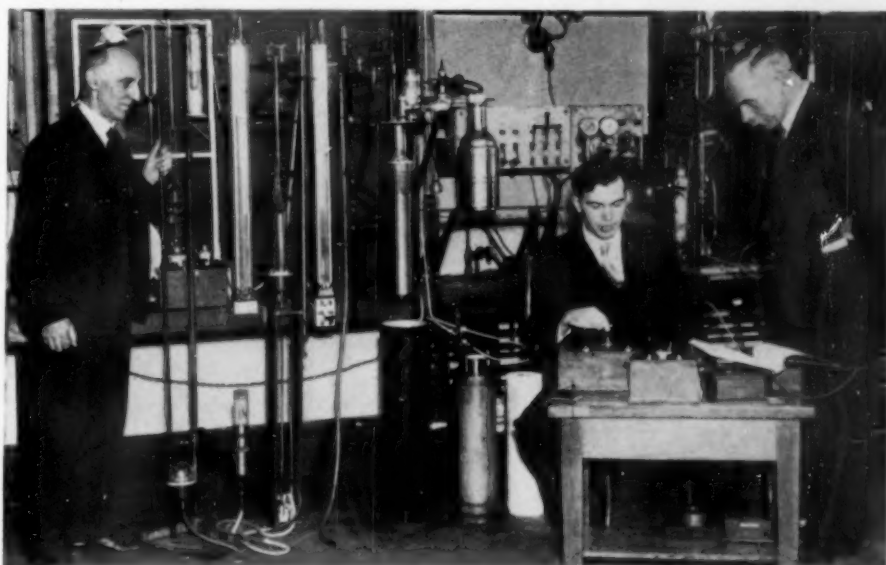
A great deal of space is taken up with grain-storage pits. These consist of huge baskets of river reeds sunk into the ground and covered with mats. Threshing-floors are shallow circular pits about twelve feet in diameter, paved with wicker-work. Baking hearths are made of more evenly-formed bricks than those used in the walls of the buildings.

Great quantities of polished and finely chipped stone tools have been found. These number, among other things, flint sickle-blades, handsaws, knives, borers, scrapers and hammers. Stone weapons include flint spear- and arrow-heads, stone falchions and polished mace-heads of a peculiar pear-shaped pattern not found in Upper Egypt at all.

Other implements have been found made of bone and ivory, but there is no metal of any kind.

There are no special burial places; the excavators came upon skeletons in all sorts of casual places among the houses. Neither were the dead given much in the way of burial gifts.

*Science News Letter, April 18, 1931*



**APPARATUS THAT LIQUEFIED HELIUM GAS**

The extremely low temperature of 456 degrees below zero Fahrenheit, only three degrees above absolute zero, was reached in the vertical glass cylinder in the center of the picture. Left to right—Dr. H. C. Dickinson, R. B. Scott and Dr. F. Henning, the latter of Berlin.



NUTRITION-CHEMISTRY

# Discovery of Two New Essentials To Life Reported by Chemists

**Studies on Rats Show That Lack of Magnesium Causes Death and That Factor in Milk Protein is Necessary**

**T**HE DISCOVERY of two new essentials to life was reported before the meeting of the American Society of Biological Chemists in Montreal last week. These substances are the metal, magnesium, and a hitherto unknown constituent of the protein of milk.

A new kind of starvation due to lack of magnesium and a hitherto unsuspected relation between the adrenal glands of secretion and magnesium as a constituent of the diet were revealed for the first time in the paper presented by Dr. E. V. McCollum and Dr. Elsa Orent of the Johns Hopkins School of Hygiene and Public Health, Baltimore. Convulsive death results from the magnesium lack.

Dr. McCollum, a pioneer in the study of vitamins, has thus demonstrated another essential to life itself. Magnesium is familiar as a metal, lighter in weight than aluminum. It also is a part of many chemicals. It is contained in the drugs, milk of magnesia and epsom salt. A very small amount of magnesium is a necessary part of the normal diet. How necessary it is and why has only just been disclosed.

Eleven days of a diet wholly lacking in this element causes convulsions and death in the majority of rats. Drs. McCollum and Orent found. On the third day of a magnesium-free diet white rats developed bright red ears and tails. In fact, wherever the skin showed through the hair, it was seen to be very red instead of the usual color. Apparently the outlying blood vessels were wide open so that all the blood flowed to the ends of the vessels just beneath the skin.

On about the tenth day of this diet, never later than the eleventh, the rats behaved very strangely. Ordinarily they pay no attention to what is going on about them and are undisturbed by noise. But after ten days of the diet, the slightest noise, such as the rattling of a piece of paper, or a shadow falling across the cage, agitated the rats so greatly that they whirled around two

or three times and collapsed in a clonic spasm. Their breathing was disturbed, their eyes protruded, and at the same time the blood rushed away from the vessels just under the skin so that the ears and tails were blanched. The blood rushed to the heart, the small blood vessels contracted, and since the heart could not pump the blood out again it became enormously enlarged.

Over four-fifths of the rats, 85 per cent. of them, died in this spasm, the remaining 15 per cent. lived on indefinitely, some for as long as 90 days, a long period in the life cycle of a rat.

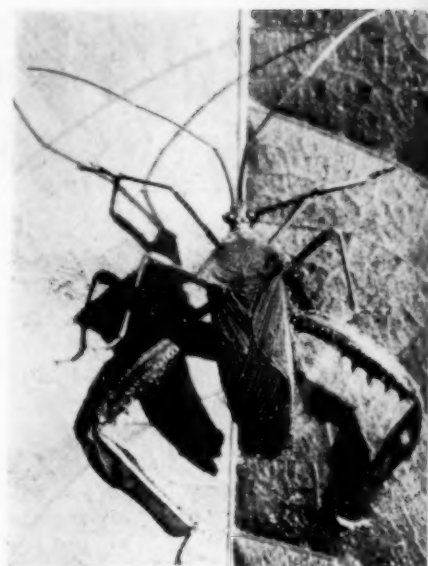
When magnesium is omitted from the diet, calcium and phosphorus are drained out of the body, so that not enough is left to make an X-ray of the rat's skeleton. This is the only way known to decalcify the body.

## Dr. McCollum's Explanation

The explanation for all this, Dr. McCollum thinks, is that there is much the same relation between the adrenal glands and magnesium as there is between the thyroid gland and iodine, or the parathyroid glands and calcium. In the convulsions of parathyroid tetany, the nervous system can be quieted by administration of calcium. The symptoms of magnesium deprivation seem to be exaggerations of the adrenal glands' response to fear or anger.

Here is evidence that two more endocrine gland systems are tied up with two inorganic structures. No relation between them has been known before, Dr. McCollum pointed out, referring to the magnesium study and to his previous study on the effect of manganese on the body. Absence of this substance affects propagation and rearing of the young, even wiping out such a powerful emotion as maternal solicitude, he reported.

The new essential to life contained within the protein of milk was announced by Dr. W. C. Rose of the University of Illinois. (Turn to Page 255)



**TERRIBLE LOOKING BUT HARMLESS**

ENTOMOLOGY-ETYMOLOGY

## Panamanian Bug is Genuine Bugbear

**T**HE WORD "bug" originally meant a specter, or ghost, or some other terrifying apparition. Only after it began to be popularly used to designate one order of insects (the *hemiptera*), and, less correctly, all insects and small creeping things in general, did "bug" become archaic in its first sense. The ghost of the original "bug" still survives in such words as "bugbear", "bugaboo" and "bogey".

The terrifying monster shown in the illustration was captured on Barro Colorado Island, in Gatun Lake. Panama Canal Zone, by naturalists from the American Museum of Natural History. He was given the benefit of considerable photographic enlargement, as may be seen from the veins of the leaf on which he is standing. But with his portentous hind legs, he is a most formidable-appearing bug, in both senses of the word.

*Science News Letter, April 18, 1931*

More than a fourth of the distance around the earth at the equator is the record set by a drifting bottle reported by the U. S. Hydrographic Office. The bottle was set adrift by Second Officer J. A. Lerch, of the American steamer *Chilbar*, off the coast of Peru in December, 1929, and was picked up on the other side of the Pacific, among the Solomon Islands, having drifted about 7,650 miles.

## EDUCATION

# Dogs Get New Type of Training To Serve As Guides for Blind

**Properly Educated Dog Will Disobey Unsafe Command Given by Blind Master, Report to World Conference States**

**D**OGS educated to guide their sightless masters have proved their high worth in Germany, where probably close to 4,000 of the animals are in actual use by blind war veterans and civilians. Efforts are now being made to extend the service in other countries. Progress of this work was described in New York during the past week at the World Conference on Work for the Blind by Mrs. Dorothy Harrison Eustis, under whose direction the dog guides are being trained at Mont Pélerin, Switzerland, for use in other countries.

Great difficulties have had to be met, for the dog guides of the blind must be educated rather than trained. Merely "trained" dogs are dangerous, as they obey commands blindly and the situation resolves itself into a case of the blind leading the blind. If his sightless master gives an unsafe command, the educated dog will, on the other hand, of his own volition disobey that command and let his master know why the command was disobeyed and what he must do to reach his objective safely.

Not only is it necessary for the dogs to be educated to guide their blind masters but the owner himself must be taught how to follow the signals of his dog. A dog guide works in a special harness, which places him next to the left knee of his master, close enough so that the blind man can feel every movement of the dog's body. These movements are signals by which the dog tells his master to step down or up, to turn to the right or left, or to stop for traffic.

How blind students in a school founded to prepare them for manual labor demonstrated such an aptitude for the profession of music that over half the pupils now earn part or all their living as organists, piano tuners or teachers of music was described by Prof. Pierre Villey of the Valentin Haüy Association of Paris. Music was at first taught only as a recreation, but instances of extremely talented blind musicians, and especially the case of a blind man who persisted, in spite of punishments, in taking pianos apart and

tuning them, led to the successful experiment.

Factors which have contributed to the success of the project in France, Prof. Villey attributed in part to special conditions existing in that country. Musical training is not so universal there as in Italy, for instance, and so there was more need of instruction, particularly among the middle classes. The Church also favored the efforts of the Paris school and coöperated by employing blind organists.

## Blind Seldom Hurt

Blind industrial workers suffer from fewer accidents than their average-sighted fellows, it is indicated by the experience of the Canadian National Institute for the Blind in the placement of the blind in work for which sight was formerly considered essential. This report was made by Capt. E. A. Baker and J. F. Clunk. They attributed this encouraging record to careful placement methods, coupled with the natural caution of the blind worker.

The jobs which blind persons of ordinary ability and normal energy can perform safely and efficiently, if employers can be persuaded to give them a trial, represent a wide range of industries.

*Science News Letter, April 18, 1931*

## MEDICINE

## Reports 21-Year Experiment In Goitre Prevention

**R**ESULTS of a 21-year experiment in the prevention of goitre in human beings by feeding foods high in iodine content have been reported to the American Association for the Study of Goitre, by Dr. J. F. McClendon of the University of Minnesota.

Dr. McClendon originally planned to make his prophylactic experiments on babies, but had to abandon the project when he found he would have to adopt the babies legally in order to complete the experiments. He then continued the

work with two families, one being used as the control and the other as the prophylactic family.

At the beginning of the experiment they were all living in a non-goitrous region. One of the women had a goitre but this was reduced by feeding her foods high in iodine. The goitre became so small as to be non-evident. The two families have lived in the Great Lakes goitre belt since 1917.

Marine animals constituted the high iodine foods for the prophylactic family for some years. Then they were changed to vegetables procured oftener than once a month from South Carolina which is in a non-goitrous region, according to the U. S. Public Health Service.

To each family were born two children during the years of the experiment. In the control family not receiving high iodine foods, the first child developed a goitre and the second child was born dead. In the family receiving the iodized foods both children were normal, Dr. McClendon reported.

*Science News Letter, April 18, 1931*



### MORE AT HOME IN THE WORLD

*A blind person can move about with greater safety if he is guided by an "educated" dog with this type of leash.*



BIOLOGY-PALEONTOLOGY

# All Flyers Began as Gliders

## Hypothetical Ancestor of All Flying Insects Had Six Stubby Wings That Helped to Lengthen Leaps

By FRANK THONE

**A**LL FLIERS began as gliders. Aviators acknowledge their debt to the experimental gliders who preceded them—Lilienthal, Chanute, the mythical Icarus. The Wrights, first of successful aviators, were gliders before they flew. Their first flying machine, indeed, was not so much a real airplane as a power glider—a glider with an engine and a couple of propellers. It was a real connecting link in a line of mechanical evolution.

Man, the latest of all creatures to learn the mastery of the air, has only repeated a story already long told by many of his lesser brethren with wings. For the birds of the air, and the insects of the field that flew long before there were any birds, and bats and pterodactyls as well, all seem to have gone through an experimental stage of gliding before they took confidently to the air for long, true flights.

Scientists are constantly uncovering new evidence in support of an evolution of flying through gliding, in a wide variety of animals that fly. As with all other lines of evolutionary development, this evidence is partly found in fossil records, partly in the behavior of animals now existing that seem to be in the midst of the job of changing from something into something else.

Flying-fishes and flying-squirrels are examples of the latter class of animals. They cannot fly, in spite of their complimentary names, but they are successful gliders; and it is quite conceivable that either or both of them might give rise to lines of descendants that in some later age would be true fliers.

But it is the record of the rocks that gives the most striking and dramatic story in this, as in all other evolutionary narratives. We cannot see the beginning or the end of such lines as flying-fishes in the living specimens. Time is too short. But fossils carry us back over long ages, and the contrast between these pages away up in the front of the book and the pages of yesterday and today, in the back of the latest volume, gives distance and perspective.

Not only do these records of the past

give this perspective, but they enable properly trained students to project the line still farther into the past, and to conjecture, with some chance of being right, what the still missing links may have been like.

This is what Dr. R. E. Snodgrass of the Bureau of Entomology, U. S. Department of Agriculture, has done with the story of insect flight. In a report written for the Smithsonian Institution he not only makes a detailed examination of the technical mechanics of the flight of the highly successful insect models of today but harks back to the strange fliers of the Coal Age, millions of years ago, and even reconstructs for us a very probable-looking hypothetical glider ancestor for all flying insects.

The creatures that gave him his clue are known only from fossils. They were a family of very primitive insects, a little like the modern stoneflies, that lived during the Coal Age and have apparently been extinct ever since.

These insects had, in front of the two pairs of wings that constitute the equipment of all typical insects, an additional pair of stubby round wing-like lobes that stuck out from the front segment of the chest region or thorax. Since the two regular wings of all insects are attached to the second and third segments of the same region, it has long been supposed by many scientists that these lobes represent a third pair of primitive wings. These ancient



INSECT OF THE COAL AGE

Restored from broken fossils. The two wing-like lobes in front of the true wings suggested the possibility that all insect wings originated as such structures.

insects probably could have flown without them, but they helped a little, giving a slight additional lift as they were pushed against the air.

Dr. Snodgrass, interested in the riddle of the origin of insect wings, asked why they might not have evolved from lobes of just this kind, projecting from the bodies of primitive insects able to run and possibly hop, but not able to fly. Extending rigidly on either side of the body, not equipped with muscles to make them fan the air, they would yet offer a considerable sustaining surface, enabling their owners to make a fairly long glide or swoop.

To make a glide of this kind, one of two types of take-off would be necessary. Either the "glider" insect would have to climb a tree or tall weed and launch itself into the air at an object some distance off and at a lower level, or else the insect would have to work up momentum by running along the ground, or perhaps by pushing itself up with a pair of catapult-like hind legs.

### A Modern Example

We can find a modern instance of just such an insect. The grasshopper has a pair of catapults aft, which hurl it into the air to very good effect, as we can see in the case of many crickets and some species of wingless grasshoppers. In other grasshopper species that have wings, the latter have apparently very little true wing power, but serve as wide glider-fans, to extend the "hopper's" leap. It is also worth noting that though grasshoppers can take off perfectly well from the ground, they are also much given to crawling up weed stems and other heights, thereby gaining also the flying-squirrel's advantage.

To make a practical test of this theoretically possible glider insect, Dr. Snodgrass drew an outline of its body on a piece of thin, stiff cardboard. He cut this out, and to its under side, at about the midpoint of the "glider-wing" area, where the chest of the insect would naturally be, he stuck a wadded-up piece of tinfoil. This was to represent the insect's body-weight. He trimmed this down to the right proportions, and then launched his imitation insect on the air. He found that if he just let go of it, the model would merely fall to the floor. But if he gave

it a little push, it would sail away in a graceful glide.

How the originally fixed and immovable lobes were evolved into the much larger, rapidly vibrating, frequently beautifully ornamented wings of insects as we now know them would be a very long story. Not much of it is known as yet. The most important step came with the achievement of movement. This required the development of muscles, and since wings were a brand new addition to the insect's equipment, and not merely a new job given to already existing forelimbs, as in birds, bats, and all other flying vertebrates, the muscles had to be borrowed somewhere or else developed completely *de novo*, like the wings themselves. After an exhaustive study of the internal musculature of insects, Dr. Snodgrass is inclined to think that the wing muscles are borrowed leg muscles trained to a new job.

What Dr. Snodgrass has done in building a hypothetical ancestry of "gliders" for flying insects, another scientist, Dr. Gerhard Heilmann, has done for flying birds.

Years ago, when the famous primitive bird skeleton now known as *Archaeopteryx* was found in Germany, people would hardly believe it was real. The creature was so much like a reptile that if the plain imprint of feathers had not been found in the fine-grained stone around it there is no likelihood whatever that it would have been called a bird. But a bird it undoubtedly was, and it established for good and all the

belief that most evolutionists had anyway, that birds were the offspring of reptiles.

Again rose the question: How did they learn how to fly? How did their wings develop?

Again the fossil suggested a solution to its own riddle. Its wings were not like those of a modern condor or gull—long, narrow, highly specialized and evolved. They were rather stubby, suggesting that the bird was not a particularly strong flier. The long tail, too—something wholly unknown in all other birds living and fossil—hinted at a considerable usefulness as a gliding organ in addition to its normal function as a rudder.

#### Archaeopteryx a Glider?

Was it not possible that this ancestor bird was a partial glider, starting from a high point on one tree and swooping, more or less like a flying-squirrel, to a lower point on another? Was it not possible that it had an ancestor even more lizard-like, than itself, even more of a glider?

A number of scientists have tried their hand at reconstructions of such a hypothetical gliding reptile-bird "pro-avian," but Dr. Heilmann's picture comes perhaps nearer combining the features of both without doing violence to either than any that have yet been attempted.

The body is long, spindle-shaped, lizard-like. The head and hind limbs are reptilian. The feathers are short, and part of them are rather scale-like. From the sides of neck, trunk and tail there are frills of feathers, suggested by frills of skin and scales still to be found on modern lizards, but developed to a point where they could serve as auxiliary gliding planes. The tail, if fact, serves to support a great part of the body weight.

In seeking the reptile ancestors of birds, scientists have of course not forgotten the flying reptiles that ruled the air when the dinosaurs ruled the earth and the sea. Pterodactyls and their kin were highly successful fliers, probably as able on the wing as hawks or buzzards are today. But they were a tribe to themselves, and have left no modern descendants. They had their day, a great day, but they have ceased to be.

What the ancestors of the pterodactyls were there is as yet no telling. They came and went rather suddenly, in the geological sense. But it is not unlikely that they, too, descended from some type of gliding reptile whose bones are still denied us by the concealing stone.



"PRO-AVIAN" BIRD ANCESTOR

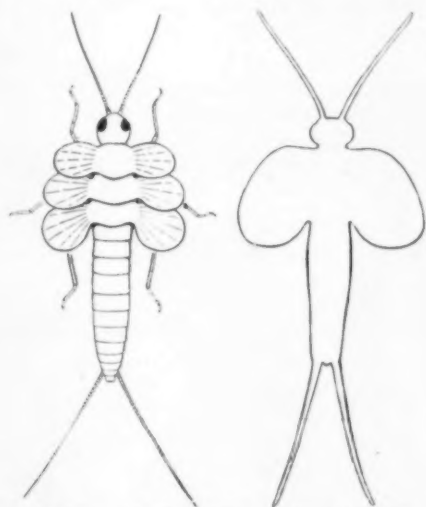
As imagined by Gerhard Heilmann. Its front limbs were neither wings nor legs. It could not fly, but with its numerous flattening frills of feathers and its long tail it could make long gliding leaps like a flying squirrel.

There remain, of the principal groups of flying animals, the modern bats, which are the only really successful flying mammals. They are far advanced in flight, too, for while they cannot make the world-girdling trips of terns or curlews they can maneuver as expertly as swallows and fly more silently than owls. They glide but little, and there is no way of conjecturing their ancestry from their habits.

One hint we may get from the structure of its wings. The bat wing, like the parachute membrane of the flying squirrel, involves both front and hind leg. It stretches between the exaggerated finger-bones and continues from the last one down the side of the body, and usually down the hind-leg also. This is strongly suggestive of a possible origin as a glider on the model of the flying-squirrel.

Possibly, if we wait long enough, other leaping mammals will become gliders, too. Possibly the flying-squirrel will become a real flying animal, a squirrel-bat. Flying monkeys are not evolutionary impossibilities. But with his better head for figures and his insatiable curiosity, greater even than that of the monkeys, man has by a single leap, within less than the lifetime of a single individual of his species, evolved into the leader of all creatures that fly.

Science News Letter, April 18, 1931



INSECT ANCESTOR AND MODEL

As imagined by Dr. Snodgrass. The six rigid lobes were not true flying organs, but rather glider planes. A cardboard model cut in the shape of the outline at the right, but larger, and properly weighted under the thorax will go into a graceful glide if launched with a little push.



## ASTRONOMY-PHYSICS

## Part of Cosmic Rays May Come From Sun

**C**OSMIC rays, the intensely "hard," all-pervading radiation that comes from somewhere in outer space, may come in some small degree from the sun.

This is indicated by recent researches of Prof. Viktor Hess of the University of Graz, Germany, one of the pioneers of cosmic ray research. With instruments set on heights in the Alps, he and other physicists have detected a very slight increase in the intensity of the radiation when the sun is at mid-heaven. This averages only about one-half of one per cent. of the total radiation, but according to Prof. Hess it is a constant, and hence probably a significant, variation.

If the sun really is the source of even a small fraction of the cosmic radiation, it lends support to the view held by a number of European scientists, that these rays come from the stars, for the sun itself is a star, and not a very large one at that. Experiments conducted by two of Prof. Hess' colleagues, Dr. O. Mathias and Dr. Steinmaurer, have indicated that there is about a two per cent. daily variation from average intensity. They are still engaged in checking up on this result.

Prof. Hess adds, however, that even if the stars are definitely shown to be sources of cosmic rays, this does not wholly shut out the possibility of a part of the rays coming also from interstellar space, the source believed in by the American school of investigators.

*Science News Letter, April 18, 1931*

## ENGINEERING

## Stabilizer Reduces Rolling On Roughest Seas

See Front Cover

**E**VEN DURING the stormiest weather there should be no sea-sick passengers on the vessel that will carry in her hold the 120-ton gyro-stabilizer pictured on the front cover of this week's SCIENCE NEWS LETTER. The photograph shows the stabilizer on test in the South Philadelphia Works of the Westinghouse Electric and Manufacturing Co., where it was built to the order of the Sperry Gyroscope Co. for a foreign shipbuilder.

The huge stabilizer is 11 feet in diameter. The rotor alone weighs 55 tons and is spun at 930 revolutions per

minute by a built-in 200 horsepower motor.

Engineers say that the apparatus, precessed by an external electric motor of 75 horsepower, would keep a 450-foot ship from rolling more than two degrees. Almost an hour is required to get the 55-ton rotor up to its speed, and when power is shut off the rotor, it will revolve of its own momentum for more than two hours.

The stabilizer is one of the largest ever constructed. A smaller one was ordered recently by the Italian government for use in a ship of 2000 tons.

It is understood that stabilizers will be introduced into trans-Atlantic passenger service when a new 45,000-ton Italian liner begins operation next year. The vessel is expected to carry three huge gyro-stabilizers, and will be the largest ship to be protected against rough seas in this manner. This will be the second important recent change in the design of trans-Atlantic liners, the first being the introduction of the bulbous bow by the German vessels, the Bremen and the Europa.

*Science News Letter, April 18, 1931*

## CONSERVATION

## Airplanes Barred as Lion-Hunters' Chariots

**H**UNTING lions from airplanes is distinctly out, in all parts of Africa where the British writ runneth.

The open veldt of the great African game country offers great possibilities for cross-country coursing in automobiles, and easy landing for airplanes. Hence sportsmen who like to take life easy in more than one sense have been father over-shooting lions.

This is regarded as bad for several reasons. It threatens the sport with extinction, which alone would be serious enough to settle the matter without further discussion, so far as many Englishmen are concerned. Sportsmen are joined in their anxiety, however, by zoologists, who do not wish to see another splendid wild animal added to the list of extinct species. And conservationists and animal ecologists see in the lion a useful regulator for the numbers of antelope and other grazing animals which without some natural check might increase too rapidly and over-graze the range.

Only in thickly populated districts, where lions become troublesome stock-killers and potential menaces to human life, is exterminative hunting tolerated.

*Science News Letter, April 18, 1931*

# IN SCIENCE

## BACTERIOLOGY

## Test Germs Weakened Before Being Killed

**S**OME of the remarkable claims for germ-killing power advanced by highly advertised antiseptics may need to be revised as the result of a report by Dr. G. F. Reddish of St. Louis, to the American Chemical Society. He found that some testing laboratories were using kinds of the peptone germ food that weaken the *Staphylococcus* test germs and thus make them easier to kill when a disinfectant or antiseptic is tested.

*Science News Letter, April 18, 1931*

## ECOLOGY

## Sunlight Is Measured In Field and Forest

**T**EN TIMES as much sunlight falls on a given stretch of open meadowland in summer as in winter. In a forest, the quantity of sunlight that filters down through the leafy roof is determined by the kind of trees that make up the stand.

These are among the facts determined by researches of Dr. Orlando Park of the University of Illinois, carried on for three years in four types of Illinois forest and in open country. The results will be presented in detail in a new scientific periodical, *Ecological Monographs*.

Dr. Park used an engineering instrument known as an illuminometer, which expresses illumination in terms of foot-candles. He found that the summer sunlight on an open meadow reached a figure as high as 10,000 foot-candles, while winter sunlight was often no more than 1,000. The sunlight reaching the ground in a forest varied according to the type of leaves overhead. Cottonwoods, evergreens, black oaks and maples each produced a characteristic filtering effect. There was also a seasonal variation in the forest, as the leaves appeared in spring, grew denser in summer, became more opaque in autumn and finally fell from the trees.

*Science News Letter, April 18, 1931*



# NE FIELDS

## ARCHAEOLOGY—AVIATION

### Air Survey Reveals Camps Along Roman Wall

**A**N AERIAL survey of the famous Hadrian's Wall, relic of Roman days in Britain, has been made by the Royal Air Force, and four temporary camps, heretofore undetected, have been located. The wall, which extended across Britain from coast to coast, marked the northern frontier of Roman territory and fortified it against invasion.

A revision of the wall's later history has come about through another recent discovery, consisting of two important inscriptions. These were found along the wall at Birdoswald. In an address before the Society for the Promotion of Roman Studies, R. G. Collingwood, British archaeologist, stated that the inscriptions explain that the wall was destroyed twice because the garrison was withdrawn by usurpers. These usurpers were using the army in Britain to aid them in a fight to gain the throne of the Roman Empire. On a third occasion, the wall fell because it was attacked on all sides at once by barbarians.

It had previously been supposed that the great wall succumbed to enemy attack because it was not a very strong and adequate line of defense.

The two new inscriptions are of the time of the Roman Emperors Severus and Diocletian.

*Science News Letter, April 18, 1931*

## BOTANY

### Beautiful Mountain Shrubs Follow Trail of Disaster

**F**IRE, avalanche, windstorms tearing down great swaths of forest—these are the path-clearers for the great thickets of rhododendron, mountain laurel and other fine shrubs whose beauty arouses the admiration of visitors to the Southern Appalachians. These plants, members of the heath family for the most part, go into such devastated areas and hang on there, in spite of the poverty of the soil and

constant winds that try to suck the life-sap out of their leaves.

This in brief summary, is the story of a study of the "heath balds" of the Great Smoky Mountains recently concluded by Dr. Stanley A. Cain of Butler University, Indianapolis. The "balds" and "slicks" of these mountains are composed of thick tangles of shrubs, which in the blossoming season are often very beautiful. Dr. Cain found in many studies of the soil that a little digging would always disclose a layer of charcoal, even if the surrounding forest showed no signs of fire in past years.

Into such "deserts" a host of plants might come. But in this particular region the soil is poor and acid, and the evaporation rates are high. This discourages all but the tough-leaved, hardy heath-shrubs. These, like the people of the southern mountains, can endure much poverty and hardship and still remain alive. Their possession of the denuded areas is an indication of better adaptability to difficult conditions than is possessed by the general run of the vegetation.

*Science News Letter, April 18, 1931*

## ARCHAEOLOGY

### Hunted Diana's Head; Found Broken Bacchus

**P**ROF. Siegfried Loeschke of the Provincial Museum at Trier, Germany, went a-hunting for Diana's head and came back with most of Bacchus. This unusual piece of archaeological hunter's luck has recently happened at the great temple district on Trier, where more than sixty pagan temples and chapels and a theater, all dating back to imperial Roman days, have been dug up within the past few years.

Some time ago a beautiful marble statue of Diana was turned up. The head was lacking, having been broken off when the image fell or was overturned. It must still be buried somewhere near where the statue was found. Professor Loeschke was regretting one day that due to post-war hard times in Germany his museum lacked funds to continue the exploration at this place, when a wealthy foreigner gave him enough money to continue the search for the missing head. The new dig disclosed, not the sought-for head of the goddess, but a broken statue of Bacchus. The head of this statue also is missing. Now Professor Loeschke is hoping for a chance to find both heads.

*Science News Letter, April 18, 1931*

## PALEONTOLOGY

### African Dinosaur Skeleton Set Up in Berlin Museum

**B**ERLIN visitors passing through the Natural History Museum will have an opportunity to see a huge dinosaur skeleton from Africa, which has just been set up. It represents a beast similar to the American dinosaurian genus *Diplodocus*, though it is not quite so large. As the skeleton stands in the museum, it measures about 41 feet in length and just under ten feet to the highest part of its arched back. It is known to science as *Dicraeosaurus*. The skeleton was collected by a recent German expedition to the Tendaguru region in East Africa.

*Science News Letter, April 18, 1931*

## CHEMISTRY

### Six In Ten "Tasteblind" To Bitter Chemical

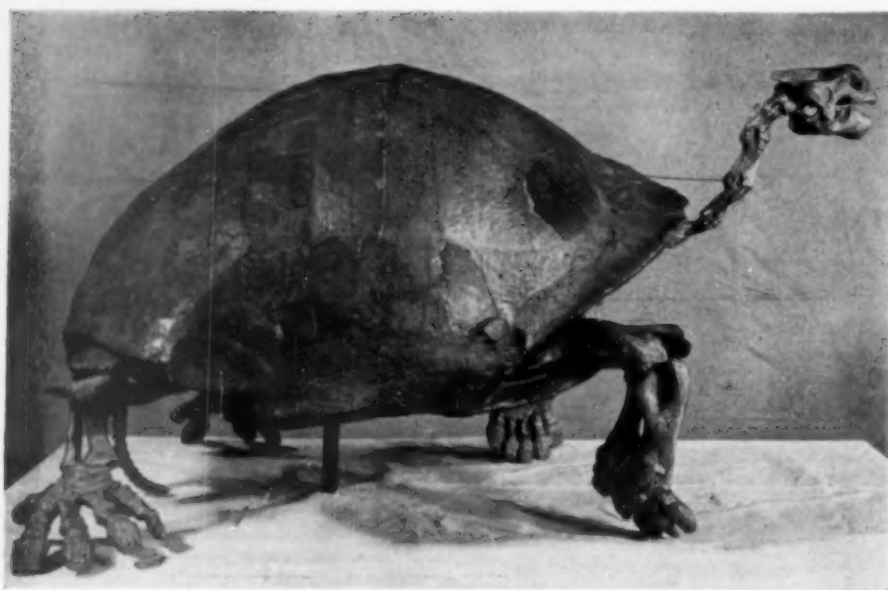
**"T**ASTEBLINDNESS" is the only term that can be found to describe the reaction of a fortunate forty per cent. of folk who cannot taste para-ethoxy-phenyl-thio-urea. For the other sixty per cent. find it intensely bitter—bitter as gall, bitter as quinine, bitter enough to make them go round sticking out their tongues and making wry faces for an hour.

This curious difference in perception has been discovered by Dr. Arthur L. Fox, of the laboratories of E. I. du Pont de Nemours and Company at Wilmington, Del. He has tried this very complex organic compound on everybody who would volunteer to taste it, and has found that approximately three-fifths of his "victims" declare it intensely bitter, while the rest say that it "has no more taste than sand."

Para-ethoxy-phenyl-thio-urea is an innocent-looking white stuff, usually available in coarsely powdered form. It is a close chemical relative to another compound, known to the trade as "dulcin," which is several hundred times as sweet as sugar. To make dulcin, one atom of sulphur is dislodged from the molecule of para-ethoxy-phenyl-thio-urea and an atom of oxygen substituted for it.

Dr. Fox has found that this curious "tasteblindness" is displayed by the same persons to other compounds as well, all of them of the thio-urea group. But so far as known, dulcin tastes exceedingly sweet to everybody.

*Science News Letter, April 18, 1931*



#### A GIANT FROM THE INDIAN HILLS

*Has found a home in the American Museum of Natural History. He is a huge tortoise (or what remains of one), seven feet, four inches long over the arch of his shell and five feet wide. It is estimated that his live weight was over a ton. He was found, broken in a thousand pieces, in the Siwalik Hills by Dr. Barnum Brown.*

#### ASTRONOMY

## Nearest Outer Galaxy Found to Contain 214,000 Bright Stars

SOME 214,000 stars, each at least a hundred times as bright as the sun, along with a gaseous nebula so brilliant that about 15 million suns would be required to rival it, are contained in the Large Magellanic Cloud, according to researches of Dr. Harlow Shapley, just announced at the Harvard College Observatory, of which he is director. The nebula, known as 30 Doradus, is probably the most luminous light source known to exist anywhere in the universe. Among the stars in the cloud is the brightest known, with a candlepower of about a hundred thousand times that of the sun. This is the star S Doradus. A telescope is needed to reveal it, but this is only because of its vast distance.

The Large Magellanic Cloud can be seen only from southern countries, and appears as a detached piece of the Milky Way. Like the Milky Way, it is made of a swarm of stars, but is separate from our own system, or galaxy. It is the nearest of these outer systems of stars, and therefore can be most readily studied. With no great reflecting telescope comparable with those of the northern observatories yet in opera-

tion in the southern hemisphere, a detailed study cannot now be made, Dr. Shapley pointed out. However, photographs made with the Bruce telescope at the Harvard Observatory's station at Mazelspoort, South Africa, permit a preliminary study of some of its general features, and particular study of some of the brighter objects that it contains.

Counting the number of bright stars involved the very tedious task of examining 57,000 separate star images on the plates. This work was performed by Miss Mary L. Miller, of the observatory staff. Twelve typical regions, each covering eight square centimeters on the plates, or about two-ninths of a square degree in the sky, were selected, and a census taken of the stars in them. A total of about one-fourteenth of the whole area of the cloud was examined. One of the most interesting results is that the cloud contains a total of about 26,710 stars brighter than absolute magnitude minus 2, and about 214,000 brighter than absolute magnitude zero. The absolute magnitude refers to the "candlepower" of the star. Actually, an intrinsically faint star often appears bright because it is very close, while a

highly luminous one, like S Doradus, may seem faint because it is so far away.

The absolute magnitude of the sun is 4.85, and the value of the individual steps is such that a star is 100 times as bright as another, when it is five units lower in the scale.

*Science News Letter, April 18, 1931*

#### MEDICINE

## Progress Toward Control Of Infantile Paralysis

ALTHOUGH not yet capable of application to human patients, Dr. William B. Brebner of the Washington University, St. Louis, has reported to the American Association of Pathologists and Bacteriologists progress in the understanding of the nature of infantile paralysis or poliomyelitis.

Working with monkeys, the animal that is most closely related to man in its reactions to medical treatments, Dr. Brebner was able to produce immunity against the virus of poliomyelitis by the injection of the virus of the disease directly into the spleen of the animals. This was a purely experimental procedure since an operation, impractical in the case of a human patient, is necessary in order to make the injection into the spleen. However, blood from the immunized monkeys showed resistance to the active virus of the disease and this was taken as an indication that the procedure may prove of some use in suggesting ways of protecting against this disease of childhood.

Physicians expect an increased prevalence of infantile paralysis this summer and fall. At present the only advisable method of treatment is to use serum obtained from the blood of those who have had the disease and who have recovered. Dr. Brebner's experiments will be continued in the hope of perfecting better methods of treatment and control.

*Science News Letter, April 18, 1931*

No substitutes have been found for some of the uses of platinum metals.

## Periodicity of Sunspots

discovered by

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is the subject of

**NEXT WEEK'S CLASSIC OF SCIENCE**



BOTANY-ETHNOLOGY

# Origins of The Vine and The Fig Tree

## "A Classic of Science"

### An Antiquarian-Botanist Worked Out the History of Two Proverbial Plants Long Cultivated by Mankind

ORIGIN OF CULTIVATED PLANTS, by Alphonse de Candolle. New York: Appleton, 1902. (First French edition in 1883.)

#### Vine—*Vitis vinifera*, Linnaeus

THE vine grows wild in the temperate regions of Western Asia, Southern Europe, Algeria, and Morocco. It is especially in the Pontus, in Armenia to the south of the Caucasus and of the Caspian Sea, that it grows with the luxuriant wildness of a tropical creeper, clinging to tall trees and producing abundant fruit without pruning or cultivation. Its vigorous growth is mentioned in ancient Bactriana, Cabul, Kashmir, and even in Badakkhan to the north of the Hindu Koosh. Of course, it is a question whether the plants found there, as elsewhere, are not sprung from seeds carried from vineyards by birds. I notice, however, that the most trustworthy botanists, those who have most thoroughly explored the Transcaucasian provinces of Russia, do not hesitate to say that the plant is wild and indigenous in this region. It is as we advance towards India and Arabia, Europe and the north of Africa, that we frequently find in floras the expression that the vine is "subspontaneous," perhaps wild, or become wild (*verwildert* is the expressive German term).

The dissemination by birds must have begun very early, as soon as the fruit existed, before cultivation, before the migration of the most ancient Asiatic peoples, perhaps before the existence of man in Europe or even in Asia. Nevertheless, the frequency of cultivation, and the multitude of forms of the cultivated grape, may have extended naturalization and introduced among wild vines varieties which originated in cultivation. In fact, natural agents, such as birds, winds, and currents, have always widened the area of species independently of man, as far as the limits imposed in each age by geographical and physical conditions, together with the hostile action of other plants and ani-

mals, allow. An absolutely primitive habitation is more or less mythical, but habitations successively extended or restricted are in accordance with the nature of things. They constitute areas more or less ancient and real, provided that the species has maintained itself wild without the constant addition of fresh seed.

Concerning the vine, we have proofs of its great antiquity in Europe as in Asia. Seeds of the grape have been found in the lake-dwellings of Castione, near Parma, which date from the age of bronze, in a prehistoric settlement of Lake Varese, and in the lake-dwellings of Wangen, Switzerland, but in the latter instance at an uncertain depth. And, what is more, vine-leaves have been found in the tufa round Montpellier, where they were probably deposited before the historical epoch, and in the tufa of Meyrargue in Provence, which is certainly prehistoric, though later than the tertiary epoch of geologists.

#### Two Ancient Varieties

A Russian botanist, Kolenati, has made some very interesting observations on the different varieties of the vine, both wild and cultivated, in the country which may be called the central, and perhaps the most ancient home of the species, the south of the Caucasus. I consider his opinion the more important that the author has based his classification of varieties with reference to the downy character and veining of the leaves, points absolutely indifferent to cultivators, and which consequently must far better represent the natural conditions of the plant. He says that the wild vines, of which he had seen an immense quantity between the Black and Caspian Seas, may be grouped into two subspecies which he describes and declares are recognizable at a distance, and which are the point of departure of cultivated vines at least in Armenia and the neighbourhood. He recognized them near Mount Ararat, at an altitude where the vine is not cultivated, where, indeed, it could not be cultivated. Other



"THE GADDING VINE"

Was known to Egyptian, Phoenician, Greek, Roman and Swiss Lake Dwellers.

characters—for instance, the shape and colour of the grapes—vary in each of the subspecies. We cannot enter here into the purely botanical details of Kolenati's paper any more than into those of Regel's more recent work on the genus *Vitis*, but it is well to note that a species cultivated from a very remote epoch, and which has perhaps two thousand described varieties, presents in the district where it is most ancient, and probably presented before all cultivation, at least two principal forms, with others of minor importance. If the wild vines of Persia and Kashmir, of Lebanon and Greece, were observed with the same care, perhaps other subspecies of prehistoric antiquity might be found. The idea of collecting the juice of the grape and of allowing it to ferment may have occurred to different peoples, principally in Western Asia, where the vine abounds and thrives. Adolphe Pictet, who has, in common with numerous authors, but in a more scientific manner, considered the historical, philological, and even mythological questions relating to the vine among ancient peoples, admits that both Semitic and Aryan



nations knew the use of wine, so that they may have introduced it into all the countries into which they migrated, into India and Egypt and Europe. This they were the better able to do, since they found the vine wild in several of these regions.

The records of the cultivation of the grape and of the making of wine in Egypt go back five or six thousand years. In the West the propagation of its culture by the Phenicians, Greeks, and Romans is pretty well known, but to the east of Asia it took place at a late period. The Chinese who now cultivate the vine in their northern provinces did not possess it earlier than the year 122 B.C.

It is known that several wild vines exist in the north of China, but I cannot agree with M. Regel in considering *Vitis Amurensis*, Ruprecht, the one

most analogous to our vine, as identical in species. The seeds drawn in the *Gartenflora*, 1861, pl. 33, differ too widely. If the fruit of these vines of Eastern Asia had any value, the Chinese would certainly have turned them to account.

#### Fig—*Ficus carica*, Linnaeus

The history of the fig presents a close analogy with that of the olive in point of origin and geographical limits. Its area as a wild species may have been extended by the dispersal of the seeds as cultivation spread. This seems probable, as the seeds pass intact through the digestive organs of men and animals. However, countries may be cited where the fig has been cultivated for a century at least, and where no such naturalization has taken place. I am not speaking of Europe north of the Alps, where the tree demands particular care

and the fruit ripens with difficulty, even the first crop, but of India for instance, the Southern States of America, Mauritius, and Chili where to judge from the silence of compilers of floras, the instances of quasi-wildness are rare. In our own day the fig tree grows wild, or nearly wild, over a vast region of which Syria is about the centre; that is to say, from the east of Persia, or even from Afghanistan across the whole of the Mediterranean region as far as the Canaries. From north to south this zone varies in width from the 25th to the 40th or 42nd parallel, according to local circumstances. As a rule, the fig stops like the olive at the foot of the Caucasus and the mountains of Europe which limit the Mediterranean basin, but it grows nearly wild on the south-west coast of France, where the winter is very mild.

We turn to historical and philological records to see whether the area was more limited in antiquity. The ancient Egyptians called the fig *teb*, and the earliest Hebrew books speak of the fig, whether wild or cultivated, under the name *teenah*, which leaves its trace in the Arabic *tin*. The Persian name is quite different, *unjir*; but I do not know if it dates from the Zend. Piddington's *Index* has a Sanskrit name, *udumvara*, which Roxburgh, who is very careful in such matters, does not give, and which has left no trace in modern Indian languages, to judge from four names quoted by authors. The antiquity of its existence east of Persia appears to me doubtful, until the Sanskrit name is verified. The Chinese received the fig tree from Persia, but only in the eighth century of our era. Herodotus says the Persians did not lack figs, and Reynier, who has made careful researches into the customs of this ancient people, does not mention the fig tree. This only proves that the species was not utilized and cultivated, but it perhaps existed in a wild state.

#### Ancient Names of the Fig

The Greeks called the wild fig *erineos*, and the Latins *caprificus*. Homer mentions a fig tree in the *Iliad* which grew near Troy. Hehn asserts that the cultivated fig cannot have been developed from the wild fig, but all botanists hold a contrary opinion; and without speaking of floral details on which they rely, I may say that Gussone obtained from the same seeds plants of the form *caprificus*, and other varieties. The remark made by several scholars as to the absence of all mention of the cul-

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tivated fig *sukai* in the *Iliad*, does not therefore prove the absence of the fig tree in Greece at the time of the Trojan war. Homer mentions the sweet fig in the *Odyssey*, and that but vaguely. Hesiod, says Hehn, does not mention it, and Archilochus (700 B.C.) is the first to mention distinctly its cultivation by the Greeks of Paros. According to this the species grew wild in Greece, at least in the Archipelago, before the introduction of cultivated varieties of Asiatic origin. Theophrastus and Dioscorides mention wild and cultivated figs.

Romulus and Remus, according to tradition, were nursed at the foot of a fig tree called *ruminalis*, from *rumen*, breast or udder. The Latin name, *figus*, which Hehn derives by an effort of erudition, from the Greek *sukai*, also argues an ancient existence in Italy, and Pliny's opinion is positive on this head. The good cultivated varieties were of later introduction. They came from Greece, Syria, and Asia Minor. In the time of Tiberius, as now, the best figs came from the East.

We learnt at school how Cato exhibited to the assembled senators Carthaginian figs, still fresh, as a proof of the proximity of the hated country. The Phœnicians must have transported good varieties to the coast of Africa and their other colonies on the Mediterranean, even as far as the Canaries, where, however, the wild fig may have already existed.

The result of our inquiry shows, then, that the prehistoric area of the fig tree covered the middle and southern part of the Mediterranean basin from Syria to the Canaries.

We may doubt the antiquity of the fig in the south of France, but a curious fact deserves mention. Planchon found in the quaternary tufa of Montpellier, and de Saporta in those of Aygalades near Marseilles, and in the quaternary strata of La Celle near Paris, leaves and even fruit of the wild *Ficus carica*, with teeth of *Elephas primigenius*, and leaves of plants of which some no longer exist, and others, like *Laurus canariensis*, have survived in the Canaries. So that the fig tree perhaps existed in its modern form in this remote epoch. It is possible that it perished in the south of France, as it certainly did at Paris, and reappeared later in a wild state in the southern region. Perhaps the fig trees which Webb and Berthelot had seen as old plants in the wildest part of the Canaries were descended from those which existed in the fourth epoch.

Science News Letter, April 18, 1931

## Presentation

### ---the key to interest



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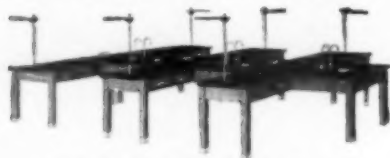
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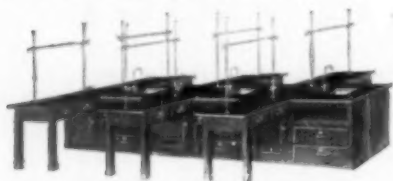
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## CHEMISTRY—NUTRITION

# Flour Made From Dried Fish Becomes Valuable Food

New Product, a Refinement of Fish Meal Now Given  
Animals Will Bring Needed Mineral Salts to Human Diet

**A** NEW product, fish flour, is about to be introduced to the palates of the American public through research by the U. S. Bureau of Fisheries and the U. S. Bureau of Chemistry and Soils.

Valuable calcium, as well as many other essential minerals, is brought to the diet by this highly refined and biologically pure fish product. Fish meal has already found use to the extent of over a hundred thousand tons annually in this country as a crude food for animals. The new fish flour is a preparation that will bring to the dinner table the same abundance of valuable mineral salts that has benefited animals.

The new flour is more highly refined than the animal fish meals and may in cooking be easily disguised to make the fish taste unrecognizable. At present the fish flour is not available commercially, but experiments by Dr. J. A. LeClerc of the Department of Agriculture's Cereals Laboratory show that it can be used as a substitute for up to 15 per cent. of white flour in sweet cookies.

Fish flour for human consumption is being produced experimentally by a commercial firm for the U. S. Bureau of Fisheries, by drying in vacuum the portions of fresh fish not now used commercially. When ground into a fine flour, it is white, fluffy, and attractive, with pleasant taste and odor.

Fish flour contains 25 to 30 per cent. of mineral matter, of which nearly half is lime. It also contains many other minerals, notably iodine which is valuable in the prevention and cure of simple goitre, and copper which has been found to be of aid in one type of nutritional anemia. Small amounts of other minerals contained in this preparation are vital to life, although their functions are not fully recognized as yet. White wheat flour contains only one-half per cent. of mineral matter, of which less than one-twentieth is lime.

In baking cookies, fish flour can simply be substituted for some of the wheat flour, and no other deviation from any

regular formula is necessary. The fish taste may be easily masked by the use of molasses, cinnamon, ginger, or other spices. Concealed by these flavorings, up to 15 per cent. of fish flour may be substituted for ordinary white wheat flour without being detected.

Dr. LeClerc has figured that if three 10-gram cookies made with 10 per cent. fish flour are eaten daily, in addition to the regular diet, by an individual who ordinarily takes two-thirds of a quart of milk a day, the calcium eaten will be increased by 20 per cent., which is sufficient to make the difference between a diet deficient and one adequate in lime.

*Science News Letter, April 18, 1931*

## PALEONTOLOGY

# Fossils of Three-Toed Horse Found in Oregon

**T**HE KNOWN range of the extinct three-toed horse in Oregon has been extended westward toward the Cascade lavas as the result of the recent discovery by W. S. Hodge of Redmond, Ore., of a number of fossil skulls in a hill near Gateway, Jefferson county, of a mammal identified as *Merychippus isonesus*, an animal about the size of a small pony. The identification was made by the late Dr. W. D. Matthew of the University of California.

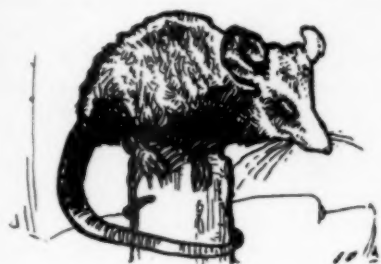
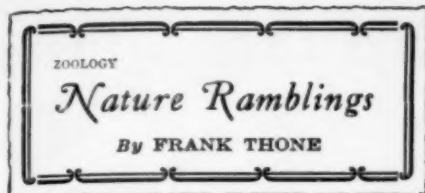
Discovery of the Gateway locality with its numerous *Merychippus* remains is held significant by Dr. Edwin T. Hodge of the University of Oregon, who is making a detailed study of rocks and formations in the Deschutes valley.

When doing field work in Trout creek, just north of the Gateway locality, several years ago, University of Oregon geologists discovered a new westerly exposure of the John Day sediments. Many fossils of Oreodons, creatures intermediate between a deer and a pig, were found.

Further field work is to be done in the new Gateway locality this year.

*Science News Letter, April 18, 1931*





Mouse-Size Opossum

ONE OF the favorite forms of natural-history interest in almost any community is the finding of live things in bunches of bananas. It is a poor grocery store that cannot have its annual tarantula scare, and sometimes other creatures even more strange come as stowaways on the little steamers that ply between our Atlantic and Gulf ports and the fruit lands of the Caribbean.

Once in a rare while one of these stowaways will be no insect or other many-legged ogre, but a tiny, blinking, somewhat scared mammal about the size and color of a mouse. Probably such visitors are more frequent than the records show, but are killed and given to the store cat as mice and therefore familiar pests.

As a matter of zoological fact, however, such a tiny furred visitor is apt to be one of the rarest prizes a northland naturalist can capture. If you are ever so fortunate as to see a mouse-sized animal clinging to a bunch of newly-unpacked bananas, examine it critically. It may look like a miniature opossum, with slightly rumpled fur, wide, inquisitive ears, clinging tail and all the other marks of the traditional Down-South Darky's favorite "eatment." If it does, it is a real opossum, the smallest of all opossums. The species lives in the jungles of tropical America and nowhere else, and wanders out into the banana plantations occasionally as its bigger relative up here raids cornfields and truck patches. And once in a long while one goes on an involuntary ride and never gets home again.

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A new process of making carpets uses goat hair for the pile and dispenses with the use of a loom.

## NUTRITION-CHEMISTRY

## Two New Essentials

From Page 244

At present its identity is hidden in the complexity of the brownish, somewhat crystalline powder that Dr. Rose's laboratory records describe as the "active fraction" of casein, the protein contained in milk.

Extensive feeding experiments upon white rats led Dr. Rose and his co-workers, Dr. Ruth H. Ellis, W. Windus, and Miss Florence Gatherwood, to the finding of the new life essential.

The protein portions of the food given these animals was replaced by highly purified amino acids, which are known to be the chemical building blocks out of which nature constructs the necessary proteins in food. Proteins make up one of the classes of foods in our diet, and they are contained most extensively in meats, milk products and other such foods.

## Thyroid Not Always Necessary

All the twenty known amino acids were used in the diets of the rats. If these twenty chemical compounds were all that make the proteins of natural food satisfactory for growth and maintenance, then Dr. Rose's rats should have grown well and waxed fat. But they did not. They were not getting something that they needed in their amino acid substitutions for protein.

Starting the search for the unknown food essential, Dr. Rose added small amounts of casein from milk, gliadin from wheat and gelatin from meat to the rodent menus, in order to find where the new essential occurs in nature. The casein helped the rats to grow. By chemical processes this protein was split into pieces until finally a fraction was found that caused the animals to grow normally when just five per cent. of it was added to their purified amino acid meals. This fraction is obtained from the casein by butyl alcohol extraction under appropriate conditions.

Dr. Rose cannot yet assign his hitherto unrecognized food factor to a proper place among the vital food essentials, such as vitamins and amino acids. More research will be necessary before this can be done. It may prove to be an amino acid, of which twenty are known to science. Four out of these twenty are known to be absolutely essential to life. These are cystine, tryptophane, lysine and histidine.

*Science News Letter, April 18, 1931*

## HORTICULTURE

## Soil In Seed-Beds Electrically Heated

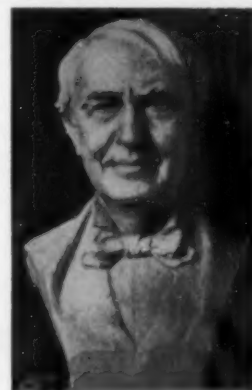
HEATING the soil in seed-beds by electricity, to hasten sprouting and early growth of plants in early spring, has been tried on an experimental scale in Sweden and Germany and is considered economically promising by Oskar Schwenninger, a Berlin engineer.

The heating units are cables of suitably high resistance, insulated and buried about a foot under the surface of the ground. It has been found possible to maintain a good germinating temperature in the soil when the air temperature is near freezing.

*Science News Letter, April 18, 1931*

Ancient inhabitants of Peru obtained wool for weaving from the alpaca, the llama, the guanaco, and the vicuna.

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## Evolution

**THE PROBLEMS OF EVOLUTION**—A. W. Lindsey—*Macmillan*, 236 p., \$2. That evolution happened, scientists no longer dispute. Why it happened, they no longer question. But when it comes to *how* it happened, they are like the famous Men of Hindustan. Truly, it is an elephant of a subject, and there is plenty of space for divergent points of view. Although the author of this compact and well-presented dissertation has himself something of a Lamarckian slant, he does not attempt finality, and he leads his reader to many a useful vantage point to take another look from.

*Science News Letter*, April 18, 1931

## Speech

**PRONUNCIATION, A PRACTICAL GUIDE TO AMERICAN STANDARDS**—Thorlief Larsen and Francis C. Walker—*Oxford University Press*, 198 p., \$2.50. The accepted usage of educated Americans is faithfully recorded and so presented that the layman can readily refer to it. Principles of good speech, as well as specific lists of words, are given. A useful little book.

*Science News Letter*, April 18, 1931

## Mechanical Engineering

**HEAT ENGINES**—Charles N. Cross—*Macmillan*, 607 p., \$6. The fundamental laws of gases and the laws of thermodynamics, together with description of the modern forms of prime movers, their operating characteristics and representative performance results of each type and size, are included in this textbook. Especially pleasing is the fact that the author has consulted the researches of the original investigators and given reference to their original papers.

*Science News Letter*, April 18, 1931

## Zoology

**A MONOGRAPH OF THE EXISTING CRINOIDS. VOL. I, THE COMATULIDS. PART 3, SUPERFAMILY COMASTERIDA**—Austin Hobard Clark—*Government Printing Office*, 816 p., 82 pl., \$2. Before Mr. Clark began his labors on the crinoids, it used to be easily asserted that this particular division of the echinoderm phylum was a "dying race," whose best days had been seen in previous geological ages. Thanks to his indefatigable efforts, the crinoids have been proved to be very much alive. When this monograph is finally com-

pleted, it will be a monumental affair of half-a-dozen volumes, summing up the world's knowledge of this interesting group of animals.

*Science News Letter*, April 18, 1931

## Volcanology

**PHYSICS OF THE EARTH. I: VOLCANOLOGY**—Subsidiary Committee on Volcanology of the National Research Council—*National Research Council*, 77 p., \$1. It is highly appropriate that the new series of the National Research Council, covering the general field of geophysics, should be initiated with this book on volcanology, for volcanic activity is the most awesome and impressive of the more rapidly-moving phenomena of earth changes. The three chapters are contributed respectively by Karl Sapper, Immanuel Friedlaender and T. A. Jaggard.

*Science News Letter*, April 18, 1931

## Meteorology

**PHYSICS OF THE EARTH. III: METEOROLOGY**—Subsidiary Committee on Meteorology of the National Research Council—*National Research Council*, 289 p., \$3.50. A symposium by eight leading workers in one of the most difficult of sciences, wherein an effort at laboratory exactness must be made under field conditions with phenomena traditionally difficult to predict and impossible to control. This book, one of a new National Research Council series in the geophysical sciences, contains in compact form the latest information about meteorology and the best methods for dealing with its problems.

*Science News Letter*, April 18, 1931

## Psychology

**THE MEASUREMENT OF NERVOUS HABITS IN NORMAL CHILDREN**—Willard C. Olson—*University of Minnesota Press*, 97 p., \$2. Describing a method for determining to what extent children are troubled with nervous habits such as thumb sucking, nail biting, twisting hair, and so on. The author also tells how these things originate.

*Science News Letter*, April 18, 1931

## Ornithology

**LOCAL BIRD REFUGES**—W. L. McAttee—*Government Printing Office*, 14 p., 5c. A Farmers' Bulletin (No. 1644) giving practical suggestions in the new movement to establish little scraps of brushy woodland everywhere, as natural shelters for songbirds.

*Science News Letter*, April 18, 1931

## Meteorology

**THE REALM OF THE AIR**—Charles Fitzhugh Talman—*Bobbs Merrill*, 318 p., \$4. The librarian of the world's largest meteorological library at the United States Weather Bureau in Washington and author of Science Service's daily syndicated feature articles under the title "Why the Weather?" here presents interestingly and accurately some of the wonders of the weather. After you read it for entertainment, you will wish to keep it on your reference shelf.

*Science News Letter*, April 18, 1931

## General Science

**STANDARDS YEARBOOK 1931**—National Bureau of Standards—*U. S. Government Printing Office*, 399 p., \$1. A wealth of interesting and valuable information is contained in this annual volume of the National Bureau of Standards of the United States Department of Commerce. In addition to reports of the many projects of the National Bureau of Standards, the activities of foreign governments and American trade associations receive attention. It is a valuable source book.

*Science News Letter*, April 18, 1931

## Bacteriology

**COMPEND OF BACTERIOLOGY**—Robert L. Pitfield and Howard W. Schaffer—*Blakiston's*, 317 p., \$2. A compact handbook for physicians and medical students.

*Science News Letter*, April 18, 1931

## Geology-Metallurgy

**AN INTRODUCTION TO THE STUDY OF ORE DEPOSITS**—F. H. Hatch—*University of Chicago Press*, 117 p., \$2.50. A concise and informed account of the formation of ore deposits by differentiation, by gaseous emanations, by thermal waters, by mechanical agencies, and by chemical precipitation and their transformation. Written for engineers.

*Science News Letter*, April 18, 1931

## Nature Study

**WONDERS OF THE PLANT WORLD**—W. A. DuPuy—*Heath*, 196 p., 88c. A supplementary science reader for the upper grades, dealing in out-of-the-way facts in plant life, or in familiar phenomena given a twist in the direction of the remarkable. The author affects short sentences and a crisp, "peppy" style that will prove very attractive to the younger generation.

*Science News Letter*, April 18, 1931